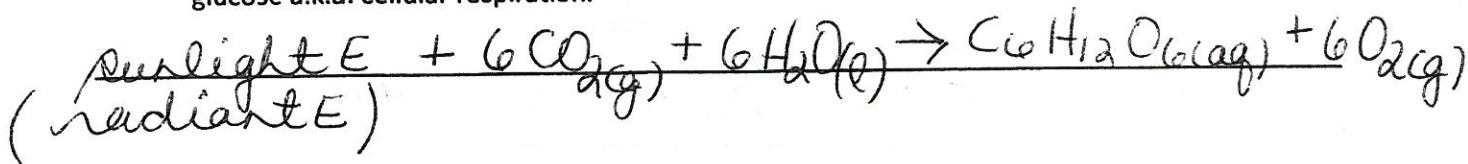


When Plants Photosynthesize

another equation to memorize

1. Write the balanced chemical equation for photosynthesis, i.e. the opposite of combustion of glucose a.k.a. cellular respiration.



2. How many moles of glucose will form if 15 moles of carbon dioxide react?

$$15 \text{ mol CO}_2 \times \frac{1 \text{ mol glu}}{6 \text{ mol CO}_2} = 2.5 \text{ mol glu}$$

3. How many grams of oxygen will form if the plant used 1.5 moles of water?

$$1.5 \text{ mol H}_2\text{O} \times \frac{6 \text{ mol O}_2}{6 \text{ mol H}_2\text{O}} \times \frac{32 \text{ g O}_2}{1 \text{ mol O}_2} = 48 \text{ g O}_2$$

4. How many moles of carbon dioxide will be used up by a tree producing 5 moles of oxygen?

$$5 \text{ mol O}_2 \times \frac{6 \text{ mol CO}_2}{6 \text{ mol O}_2} = 5 \text{ mol CO}_2$$

5. How many grams of glucose will be produced if a plant uses up 35 g of carbon dioxide?

$$35 \text{ g CO}_2 \times \frac{1 \text{ mol CO}_2}{44 \text{ g CO}_2} \times \frac{1 \text{ mol glu}}{6 \text{ mol CO}_2} \times \frac{180 \text{ g glu}}{1 \text{ mol glu}} = 23.9 \text{ g glu}$$

6. What mass of oxygen will produce 45 g of glucose?

$$45 \text{ g glu} \times \frac{1 \text{ mol glu}}{180 \text{ g glu}} \times \frac{6 \text{ mol O}_2}{1 \text{ mol glu}} \times \frac{32 \text{ g O}_2}{1 \text{ mol O}_2} = 48 \text{ g O}_2$$

7. How many molecules of carbon dioxide will be used up to produce 100. g of oxygen?

$$100. \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32 \text{ g O}_2} \times \frac{6 \text{ mol CO}_2}{6 \text{ mol O}_2} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol CO}_2} = 1.88 \times 10^{24} \text{ molecules CO}_2$$